New Analytical Tools for Safety Management of Urban and Suburban Arterials

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Key Developments

- New and better organized information on countermeasure effectiveness
- Better tools to identify problems and formulate solutions
- Better tools to quantify the safety performance of arterials

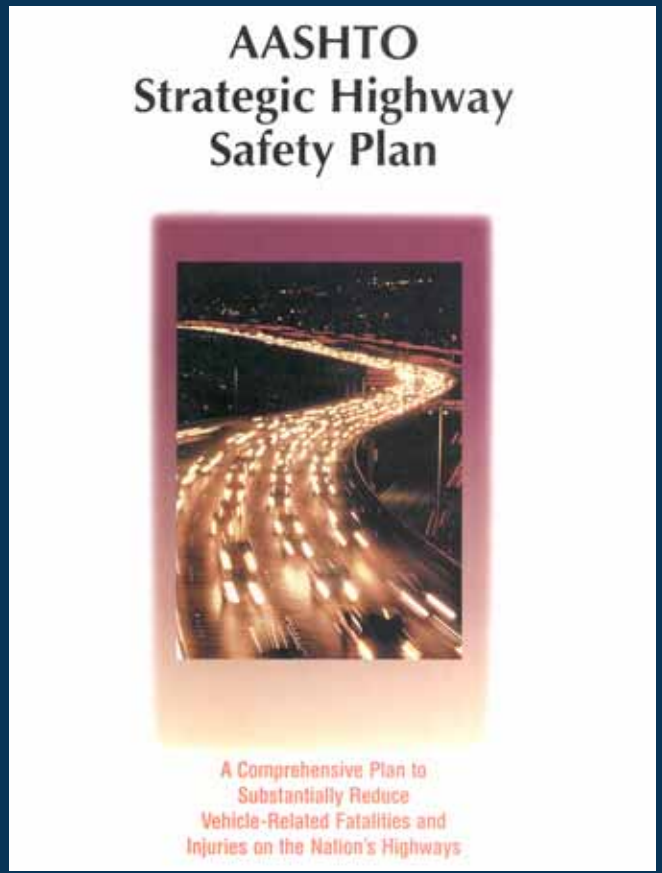
New and Better Organized Information on Countermeasure Effectiveness

Access Management Manual

A major step forward……

TRB’s Access Management Manual

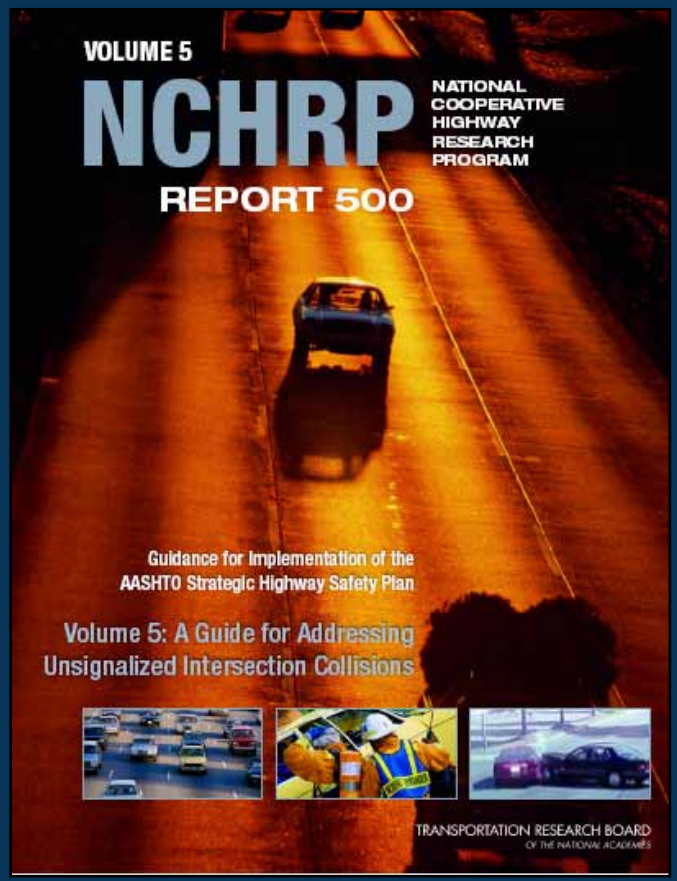
AASHTO Strategic Highway Safety Plan



GOAL:

- Reduce fatality rate from 1.5 to 1.0 deaths per 100 MVMT and over 9,000 lives saved annually by 2008

NCHRP Report 500 Implementation Guides



- Printed guides – published by TRB
- Web site – safety.transportation.org/plan.aspx

NCHRP Report 500 Implementation Guides

ALREADY PUBLISHED

- Aggressive Driving
- Unlicensed Drivers/ Suspended and Revoked Licenses
- Trees in Hazardous Locations
- Unsignalized Intersections
- Head-on Accidents
- Run-off-road Accidents

SUMMER 2004

- Older Drivers
- Safety Belts
- Heavy Trucks
- Pedestrians
- Horizontal Curves
- Utility Poles
- Signalized Intersections

NCHRP Report 500 Implementation Guides

SPRING 2005

- Motorcyclists
- Work Zones
- Rural EMS
- Distracted/Fatigued Drivers
- Alcohol

SPRING 2006

- Bicycles
- Younger Drivers
- Head-on Crashes on Freeways
- Data Needs, Sources, and Analysis

Better Tools to Identify Problems and Formulate Solutions

Needs for Improved Software Tools

- Current computer algorithms for network screening to identify potential problem locations use 1960s and 1970s approaches
- Collision diagram software is not always directly integrated with traffic accident records systems
- Collision diagrams typically focus on intersections, but not roadway segments between intersections

Needs for Improved Software Tools

- Identification of accident patterns from collision diagrams is typically a manual process
- Countermeasure selection is typically a manual process
- Economic analysis is generally not integrated with traffic accident records systems

Needs for Improved Software Tools

- Effectiveness evaluation of implemented countermeasures:
  - not performed routinely
  - use outdated statistical procedures
  - require manual or off-line analysis

FHWA *SafetyAnalyst* Software Tools

- Network screening to identify sites with promise for safety improvement
- Diagnosis to identify accident patterns
- Countermeasure selection
- Economic analysis
- Priority ranking
- Post-implementation evaluation of safety effectiveness

FHWA *SafetyAnalyst* Software Tools

- Further information

www.safetyanalyst.org

Better Tools to Quantify the Safety Performance of Arterials

TRB Highway Safety Manual

- Will present procedures to make quantitative safety estimates:
  - safety performance of specific roadways and intersections
  - anticipated safety effects of proposed improvement projects
- Analogous to how the HCM is used for traffic operational estimates
- First edition -- 2008

TRB Highway Safety Manual

- Part I – Introduction
- Part II – Safety Knowledge
- Part III – Prediction Methodologies
  - rural two-lane highways
  - rural multilane highways
  - urban/suburban arterials
- Part IV – Safety Management
- Part V – Safety Effectiveness Evaluation

Completed Research

- NCHRP Project 17-18(4)
  - scoping study
  - developed overall work plan for HSM development
  - developed detailed outline
  - developed prototype chapter on rural two-lane highways

Ongoing Research

- NCHRP Project 17-26
  - developing safety prediction methodology for urban and suburban arterials
- NCHRP Project 17-29
  - developing safety prediction methodology for rural multilane highways
- NCHRP Project 17-27
  - developing HSM Part I – Introduction
  - developing HSM Part II -- Knowledge

Safety Prediction Methodology for Urban and Suburban Arterials

- Types of roadway segments considered:
  - two-lane undivided
  - four-lane undivided
  - four- and six-lane divided
  - three- and five-lane with center TWLTL

Safety Prediction Methodology for Urban and Suburban Arterials

- Types of intersections considered:
  - three-leg with minor-road STOP control
  - three-leg signalized
  - four-leg with minor-road STOP control
  - four-leg signalized

Safety Prediction Methodology for Urban and Suburban Arterials

- Safety predictions will be made separately for each:
  - roadway segment
  - intersection
- Within roadway segments, safety predictions may be made separately for:
  - individual driveways
  - individual median openings

Safety Prediction Methodology for Urban and Suburban Arterials

- Overall safety predictions for a extended section or project:
  - sum safety performance for individual design elements
- Empirical Bayes procedures to compensate for regression to the mean

Highway Safety Manual

- Further information:

www.highwaysafetymanual.org